



ZIKA: MOSQUITO-BORNE VIRUS

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Mosquito-borne diseases in Florida

- Dengue
- Malaria
- Yellow Fever

1800s

- Dengue
- Dog heartworm
- EEE
- Malaria
- SLE

1900s

- Chikungunya
- Dengue
- Dog heartworm
- EEE
- Malaria
- SLE
- West Nile

2000s

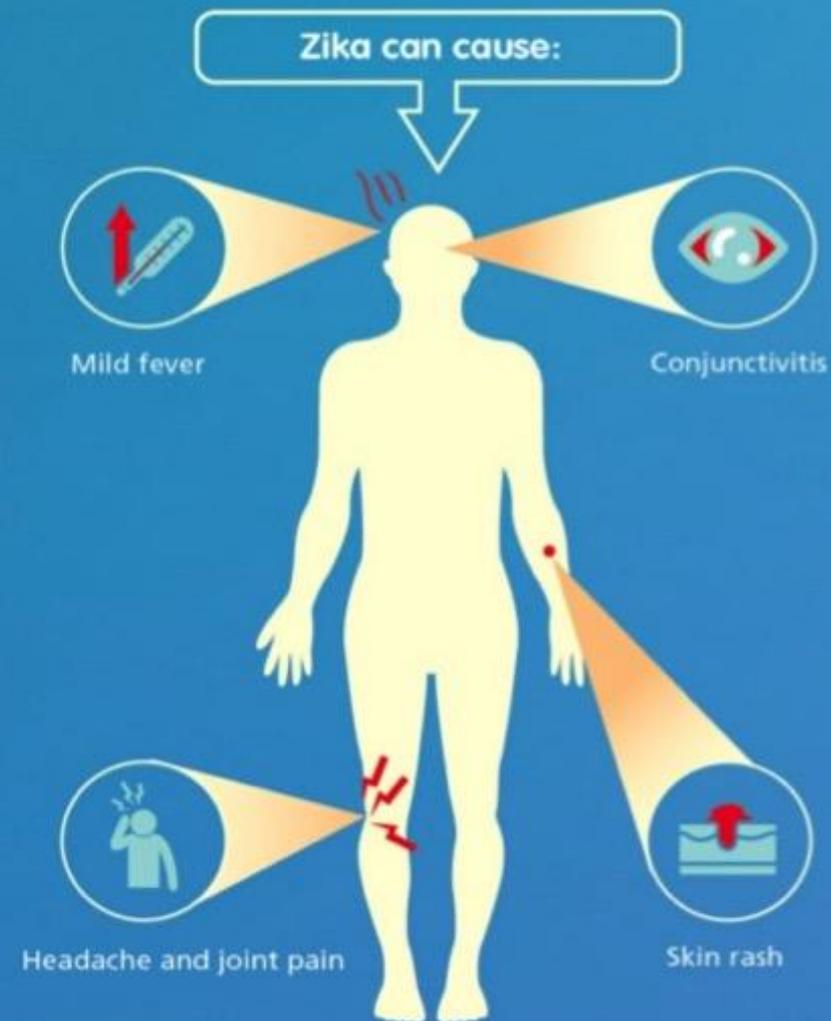
Zika?

Zika

- Zika is a virus that can be transmitted by the bite of infected female mosquitoes
- The virus is cycled between mosquitoes and humans
- Infection with the virus may or may not cause sickness in humans
- Currently there is no vaccine against Zika virus

Symptoms

- The symptoms of the disease can include:
 - Fever
 - Joint pain
 - Rash
 - Conjunctivitis
 - Muscle Pain
 - Headache
- Four out of five infected persons do not develop any symptoms



Pan American
Health
Organization



World Health
Organization
REGIONAL OFFICE FOR THE
Americas

How is it transmitted?

- The Zika virus is primarily transmitted by the bite of an infected mosquito
 - The Yellow Fever Mosquito (*Aedes aegypti*)
 - The Asian Tiger Mosquito (*Aedes albopictus*)



Areas currently reporting active transmission of Zika virus



From Centers for Disease Control
<http://www.cdc.gov/zika/index.html>

Reported active transmission

Imported vs local transmission (mosquito)

- Where was the individual infected with Zika?
- Imported cases
- Local transmission/Locally acquired
 - Means FLORIDA populations of mosquitoes are transmitting the virus
- There are reported local transmission of Zika virus from Florida mosquitoes
- Mosquitoes from two locations in Dade County Florida have been found to be infected with Zika

Zika virus is not part of the Florida sentinel chicken program

County officials: Sentinel chickens are first line of defense against West Nile, mosquito control

By Michael Majchrowicz, Times Staff Writer
Friday, July 10, 2015 7:56am

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TARPON SPRINGS — Chickens are the first line of defense — and an effective one — against the West Nile virus, as far as Pinellas County officials are concerned.

RELATED NEWS/ARCHIVE

With 19 positive tests, health officials again warn of West Nile Virus in Pinellas County
5 Months Ago

Pinellas records first human case of West Nile Virus in 2015
5 Months Ago

As Florida Gov. Rick Scott raises the alarm on Zika virus, Tampa Bay mosquito control officials say don't panic yet
4 Days Ago

A chicken in Tarpon Springs tested positive for the virus on Thursday. This was the first confirmed appearance of the mosquito-borne illness this year. But the infection wasn't happenstance.

The infected chicken belongs to a coop that is part of the county's sentinel program. These chickens are purchased from a provider and raised by the county. When a chicken is infected — with West Nile

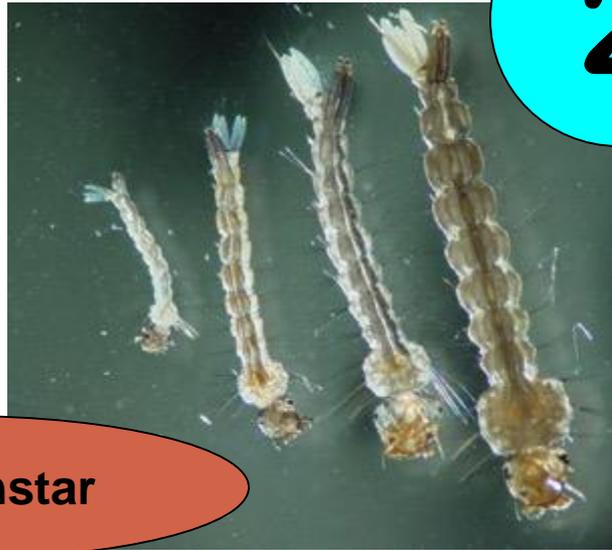


Michael Majchrowicz | Times
Chickens are shown on site at the Pinellas County Environment and Infrastructure building. While these are not sentinel chickens themselves, their counterparts are typically purchased from a provider and raised by the



1

The Mosquito Life Cycle



Larvae

1st – 4th Instar

2

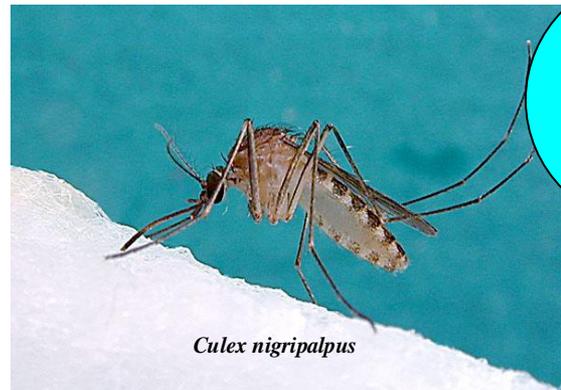


3

Pupa

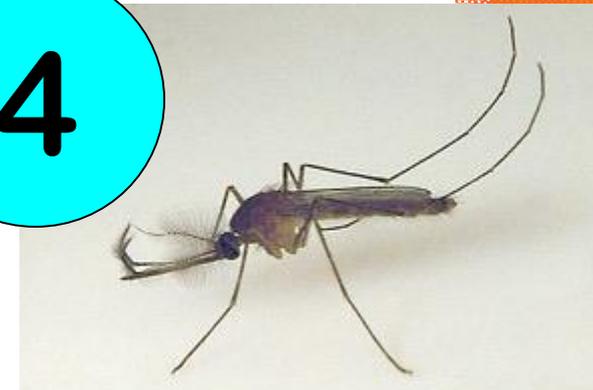
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Adult



Culex nigripalpus

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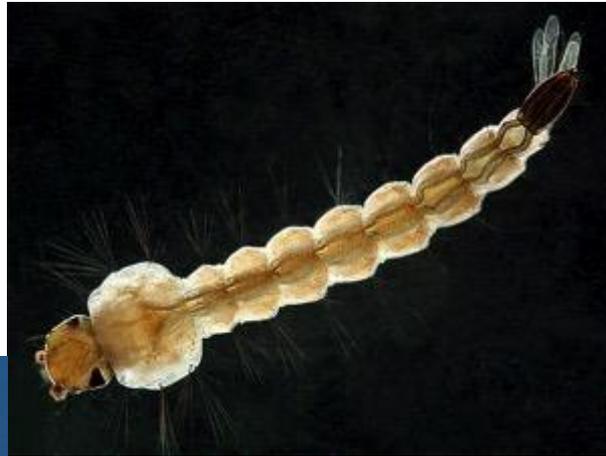


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Aedes Aegypti, THE YELLOW FEVER MOSQUITO



Aedes albopictus, THE ASIAN TIGER MOSQUITO



Container Mosquitoes

- *Aedes aegypti* and *Aedes albopictus* are container mosquitoes
- The larvae are found in containers that hold even very small amounts of water
- The best way to control these mosquitoes is to clean up around the home by removing containers that can hold water

LARVAL HABITATS OF CONTAINER MOSQUITOES



Larval habitats of container mosquitoes



Larval habitats of container mosquitoes



Larval habitats of container mosquitoes

- Bromeliad plants can house container mosquitoes in the water-holding tanks



[Link: Bromeliad-inhabiting Mosquitos in Florida](#)

Role of UF/IFAS Extension

- Provide science-based information about ways to reduce exposure to mosquito bites
- Provide science-based information about ways to reduce mosquitoes around the home
- Direct our clients to the Florida Department of Health and Centers for Disease Control for information on the human disease
- Adapt current programs and develop new program to be proactive about mosquito source reduction

Prevention

- Eliminate container mosquito habitats
- Wear protective clothing when exposed to mosquitoes (e.g., long sleeves and pants)
- Use Effective repellents

Recommendations to reduce abundance of container mosquitoes

- Yard inspections once per week
 - Remove, or drain water-holding items
 - Modify objects so that they don't hold water
- Neighborhood clean up events
 - A community effort is needed right now! It requires that everyone participate to reduce these mosquitoes
- Treat water that can't be dumped out
 - Mosquito dunks (containing a mosquito-specific bacteria, Bti) work very well

Recommendations to reduce abundance of container mosquitoes

- For containers that are used for water collection (i.e., rain barrels), place a screen over the top to prevent mosquitoes from laying eggs in the water
- For bird baths, dump out water and replace with clean water every week
- Get rid of or recycle used tires
- Clean the roof gutters

Mosquito repellents

- Mosquito repellents are an excellent method of reducing exposure to mosquito bites
- Proper application methods are important
- It is important to understand what active ingredient is in the repellent and whether or not it has been shown to be effective

<u>Active Ingredient</u>	<u>Product Name</u>	<u>Protection Time</u>
OFF! Deep Woods	23.8% DEET	5 hours
Sawyer Controlled Released	20% DEET	4 hours
OFF! Skintastic	6.65% DEET	2 hours
Bite Blocker for Kids	2% Soybean Oil	1.5 hours
OFF! Skintastic for Kids	4.75% DEET	1.5 hours

<u>Active Ingredient</u>	<u>Product Name</u>	<u>Protection Time</u>
Skin-So-Soft Bug Guard Plus	7.5% IR3535	23 minutes
Natrapel	10% Citronella	20 minutes
Herbal Armor	12% Citronella, 2.5% Peppermint Oil, 2% Cedar Oil, 1% Lemongrass Oil, 0.5% Geranium Oil	19 minutes
Gone Original Wristband	9.5% DEET	0
Gone Plus Repelling Wristband	25% Citronella	0

Mosquito repellents

- The following types of products that have been advertised as mosquito repellents or control products have NOT been found to be effective
 - Devices that emit sound to repel mosquitoes
 - Consumption of garlic, bananas, Vitamin B
 - Bracelets
 - Bug Zappers
 - Bug patches



Summary: Preventing exposure to mosquitoes

- Remove container mosquito habitats
- Wear protective clothing
- Use repellents that work

Additional resources

- [FMEL Website - Zika Frequently Asked Questions](#)
- [Center for Disease Control Zika Information](#)
- [Florida Health.gov - Diseases and Conditions/Zika Virus](#)
- [Mosquito.ifas.ufl.edu - Zika Information](#)
- [Center for Disease Control - Fact Sheets and Posters](#)
- [New England Journal of Medicine Article on Zika Virus](#)
- [EDIS Publication - Mosquito Repellents](#)

ENY-753

Florida Resident's Guide to Mosquito Control

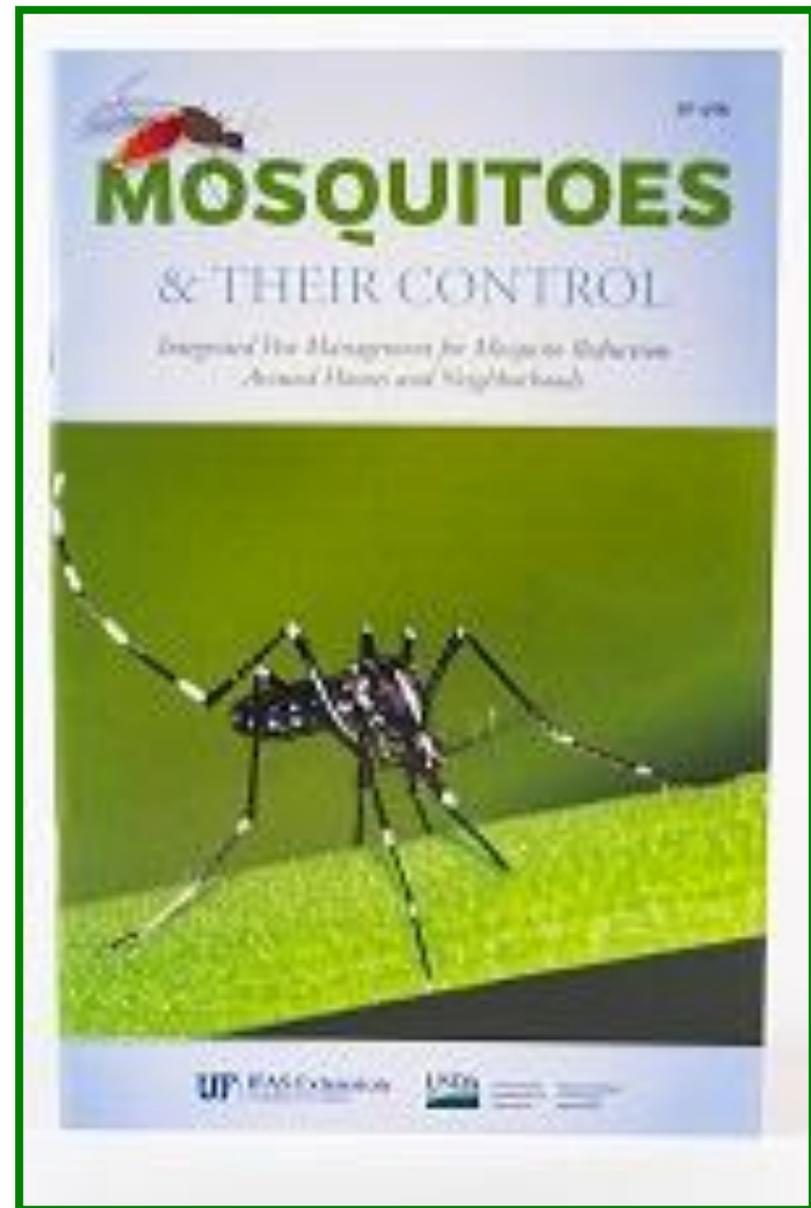
INTEGRATED PEST MANAGEMENT FOR
MOSQUITO REDUCTION AROUND HOMES AND
NEIGHBORHOODS



UF UNIVERSITY of
FLORIDA
IFAS Extension

USDA United States Department of Agriculture
National Institute of Food and Agriculture

[EDIS: IPM for Mosquito Reduction](#)



[IFAS Bookstore: Mosquitos and Their Control](#)



Mosquito Bite Protection for Overseas Travelers

FloridaHealth.gov • Florida Department of Health

Mosquitoes spread viruses and parasites that cause diseases like chikungunya, dengue, Zika and malaria. Before you travel to areas where these diseases are found, talk to your health care provider about your health concerns, and ask about malaria prevention medicine.

Mosquitoes can live indoors and will bite at any time, day or night.

Bring Environmental Protection Agency (EPA)-registered insect repellents

When you travel to areas with mosquitoes, bring an EPA-registered insect repellent. Use products with active ingredients that are safe and effective.

- Always follow the product label instructions.
- Do not spray repellent on skin under clothing.
- If you use sunscreen, put sunscreen on first and insect repellent second.
- It is safe for pregnant or nursing women to use EPA-approved repellents if applied according to package label instructions.
- Learn more: www2.epa.gov/insect-repellents.



USE INSECT REPELLENT WITH ONE OF THESE ACTIVE INGREDIENTS

DEET →→

Picaridin (KBR 3023), Bayrepel and tearidin →→

Oil of lemon eucalyptus (OLE) or para-menthane-diol (PMD) →→

IR3535 →→



BRAND EXAMPLES* Overseas brand names may vary.

Off!, Cutter, Sawyer, Ultrathon

Skin So Soft Bug Guard Plus, Autan (outside the U.S.)

Repel

Skin So Soft Bug Guard Plus Expedition, Skin Smart

Higher percentages of active ingredient—longer protection

Cover up with clothing

- Wear long-sleeved shirts and long pants.
- Mosquitoes can bite through thin clothing. Treat clothes with permethrin or another EPA-registered insecticide for extra protection.



Use permethrin-treated clothing and gear.

- Permethrin is an insecticide that kills mosquitoes and other insects.
- Buy permethrin-treated clothing and gear (boots, pants, socks, tents), or use permethrin to treat clothing and gear—follow product instructions closely.
- Read product information to find out how long the permethrin will last.
- Do not use permethrin products directly on skin.

Keep mosquitoes out of hotels rooms & other lodging

- Choose a hotel or lodging with air conditioning and screened windows and doors.

If you will be sleeping outside or in a room that is not well screened, buy a bed net BEFORE traveling overseas.

- Buy bed nets from an outdoor store, and choose a WHOPEs-approved bed net (like Pramax®): compact, white, rectangular, with 156 holes per square inch and long enough to tuck under a mattress.

- Permethrin-treated bed nets provide more protection than untreated nets.



- Do not wash bed nets or expose them to sunlight—this will break down permethrin more quickly.

- Learn more: www.cdc.gov/malaria/malaria_worldwide/education/tn.html.

www.cdc.gov/features/StopMosquitoes

*The use of commercial names is to provide information about products; it does not represent an endorsement of these products by the Centers for Disease Control and Prevention or the U.S. Department of Health and Human Services.

Questions?

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Visit these links for more information:

[Florida Medical Entomology Laboratory](#)

Mosquito.ifas.ufl.edu